

## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 Background**

Vision is a powerful robot sensing capability. Vision is not used in an exploratory sense but is use to confirm measure or refine existing data. Hence, sensors and hardware associate with the robot vision are more complex than other types of sensors. With this capability, we are able to perceive, identify and recognize objects.

Robot Vision is use to extract or interpret information from images of a three dimensional worlds where it provide robot with the capability of sensing which present in human vision. This computer vision process may be subdivided into six principle areas which are sensing, preprocessing, segmentation, description, recognition and

interpretation. These operations will process image data and matching the image features against stored prototypes.

In robotic world, mobile robot can be used at home as a pet or toy even home equipment like vacuum. The ability of moving from a place to another makes the robot be able to complete task like searching over victims that buried under destroyed buildings, or defusing bombs. Once a vision system has been programmed, it will perform particular inspection task and return result as through any other sensor.

### **1.1.1 Introduction to the project**

BoeBot was also known as Board of Education robot, introduced by Parallax Inc. It is a complete reprogrammable robot kit. It used software simulator and digital trainer board in conjunction to bridge gap between hardware and software. In this project, CMU cam is applied to the board to enhance the capability of vision sensing. CMU camera is a device that specially modified by Parallax to seamlessly integrated with Boe-Bot platform.

In order to develop a base prototype, Basic Stamp Editor is used to as it is the software simulator for the BoeBot. The programs build-up will be stored in BoeBot's brain, the BASIC Stamp 2 microcontroller. Once the program is transferred to the microcontroller, the mobile robot will perform autonomous tasks based on the program. This project development includes detection of arrows using CMU camera through shape recognition and mobile robot moves according to the program developed.

### **1.1.2 Problem Statement**

Human errors are seems to be the main cause of traffic accident happen. By implement advance technology to the vehicle, we are able to reduce accident happening. Vision system is more intelligent rather than using traditional sensors. Thus, sign detection system is applied to vehicle to reduce human cause errors.

## **1.2 Objective**

The aim of this project is to move a vision system for mobile robot navigation. The main objective of this project is to develop a program of vision camera robot for detect shape.

## **1.3 Scopes of Project**

This research will be the implementation of a software tracking system to induce the mobile robot to track a desired shape. The robot will track and lock on an arrow which it will then move based on the arrow direction. As if the robot detects another sign, it will change direction and move according to the latest sign detected. The robot will stop at a specific distance after the last detection.